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A Scoping Review on the Medical and Recreational Use of Cannabis During the COVID-19 Pandemic

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Abstract

Background/Introduction: The shelter-in-place orders and social distancing regulations on account of the COVID-19 pandemic have impacted lifestyles, including the use of cannabis. The purpose of this scoping review is to summarize both the gray and academic literature on the use of cannabis during the pandemic.

Materials and Methods: A total of 11 databases, including 2 medical databases, 7 social science databases, and 2 gray literature databases were searched resulting in 316 titles and abstracts of which 76 met inclusion criteria.

Results: Nine themes emerged: (a) prevalence and trends of cannabis use during COVID[1]19; (b) demographics; (c) profile of mode of consumption; (d) context of using cannabis (i.e., solitary use vs. in groups); (e) factors contributing to use; (f) factors inhibiting use; (g) adverse clinical and psychiatric outcomes of cannabis use during the pandemic; (h) similarities between EVALI (E-Cigarette or Vaping Product Use-Associated Lung Injury) and COVID-19 symptoms; (i) implications for policy and practice. Studies published until February 2, 2021 were included in this review.

Discussion: Findings have highlighted that feelings of boredom, depression, and anxiety during the pandemic have contributed to an increase in the use of cannabis. Furthermore, accessibility to cannabis was noted to affect use during the pandemic. Adverse psychiatric and clinical outcomes were associated with the increased use of cannabis.

Conclusion: Practitioners and policymakers are called to employ harm reduction strategies to respond to increasing cannabis use. There is a need for population-based studies and further examination of factors contributing to the increased use of cannabis during the pandemic and associated negative consequences.

Keywords: coronavirus; COVID-19; cannabis

Context and Background

As of March 1, 2021, over 114 million COVID-19 cases have been reported worldwide.[1] The severe acute respiratory syndrome infection (SARS-CoV-2) warranted immediate response measures from governments across the globe. Various emergency measures, such as lockdowns and stay-at-home orders, have been implemented in an effort to combat the infectious spread of the virus in communities.[2]

Restrictions to everyday routines and social engagements, business closures, and travel bans have affected individuals, both locally and globally. At the forefront of the many health concerns, the rising prevalence of mental illness[3,4] has been the focus of much of the emerging literature. The pandemic has had significant socioeconomic consequences, including the loss of jobs[5] and changes in financial stability.[6]

Recent studies have further shed light on the impact of COVID-19 on individual functioning, with outcomes related to stress,[7,8] loneliness due to social distancing, depression,[9] insomnia,[10] anxiety, anger,[11] and boredom.[12] Health practitioners have noted changing behaviors across populations, such as poor eating habits,[13] higher rates of reported thoughts of suicide,[14] and increased substance use, including alcohol[15] and cannabis.

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Cannabis Use During the COVID-19 Pandemic

During the pandemic, small nonrandom studies have suggested there has been an increase in the use of cannabis across European countries, such as France, Italy, and the Netherlands,[16] as well as in the USA and Canada.[17,18] It is also worth noting that there are a range of methods used, which allow readers to consider the literature as a whole to identify trends pertaining to cannabis use during the pandemic. However, limitations exist when interpreting these findings due to a lack of rigorous representative sampling in these studies.

This purported increased use of cannabis has been attributed to various factors, including stress and anxiety exacerbated by the pandemic, social isolation and loneliness, in addition to disruptions to daily routines because of the closures of numerous facilities and workplaces.[19,20]

To the best of our knowledge, this is the first scoping review examining the use of cannabis during COVID-19. This study examines the literature on the prevalence of cannabis use, characteristics of cannabis users, factors inhibiting and contributing to use, and its associated outcomes. Findings of this review aim to better understand cannabis use during the pandemic and consider whether there are likely to be public health consequences.

Methods

A computerized search of the literature was conducted in February 2021. A total of 11 databases, including 3 medical database (Cochrane COVID-19 Study Register, OVID Medline and Embase), 7 social science databases (OVID PsycINFO, ProQuest PsycINFO, Social Work Abstracts, Age Line, CINAHL, Social Services Abstracts, and Sociological Abstracts), and 1 gray literature (WHO COVID-19) were searched: A manual search through reference lists in selected literature was also conducted to identify potential additional sources. Furthermore, we used Google scholar cited reference search to identify any new sources that had cited any of our included articles. The keywords used are displayed in Table 1.

Inclusion and exclusion criteria

Scholarly articles in English on the use of cannabis during the pandemic reporting qualitative and quantitative data, commentaries, letters, case studies, editorials, reports, and opinion pieces written were included. There were no restrictions on the region of the study or age or gender of the participants. Medical studies investigating the use of cannabis for the prevention and treatment of physical symptoms associated with the COVID-19 virus were excluded.

Data extraction

As presented in Figure 1, the database searches described earlier resulted in 290 unique titles and an additional 26 articles were identified from a review of references and or cited reference searches of our included articles. Titles and abstracts were then reviewed independently by two researchers. From these, 127 articles were identified for full-text review. Of these, five were excluded on the basis of language or being unavailable for full-text review because of access through a paywall service. The full texts of the remaining articles were reviewed by two independent researchers. After full-text review, 76 articles met the inclusion criteria and were included in the qualitative synthesis.

Results

A total of 76 academic and gray literature articles were identified for review. The authors conducted a thematic analysis to identify themes in the articles. Nine main themes were identified:

1. Prevalence and trends of cannabis use during COVID-19;
2. Demographics;

Table 1. Search terms

Cannabis keywords	(Cannabis/OR Cannab* OR marijuan* OR tetrahydrocannabinol OR skunk OR hashish* OR hash OR thc OR pot OR weed OR cbd OR ganja* OR marihuana OR hemp* OR bhang*)
Covid keywords	(COVID 19 OR severe acute respiratory syndrome coronavirus 2 OR (2019 nCoV or 2019nCoV or "2019-novel cov") OR (corona vir* or coronavir* or neocorona vir* or neocoronavir*) OR COVID OR COVID19 OR (nCov 2019 or nCov 19) OR ("SARS-CoV-2" or "SARS-CoV2" or SARSCoV2 or "SARSCoV-2") OR ("SARS coronavirus 2" or "SARS-like coronavirus" or "Severe Acute Respiratory Syndrome Coronavirus-2") OR Coronavirus Infections/OR Coronavirus/).
Cannabis and Covid keywords	(Cannabis/OR Cannab* OR marijuan* OR tetrahydrocannabinol OR skunk OR hashish* OR hash OR thc OR pot OR weed OR cbd OR ganja* OR marihuana OR hemp* OR bhang*) AND (COVID 19 OR severe acute respiratory syndrome coronavirus 2 OR (2019 nCoV or 2019nCoV or "2019-novel cov") OR (corona vir* or coronavir* or neocorona vir* or neocoronavir*) OR COVID OR COVID19 OR (nCov 2019 or nCov 19) OR ("SARS-CoV-2" or "SARS-CoV2" or SARSCoV2 or "SARSCoV-2") OR ("SARS coronavirus 2" or "SARS-like coronavirus" or "Severe Acute Respiratory Syndrome Coronavirus-2") OR Coronavirus Infections/OR Coronavirus/)

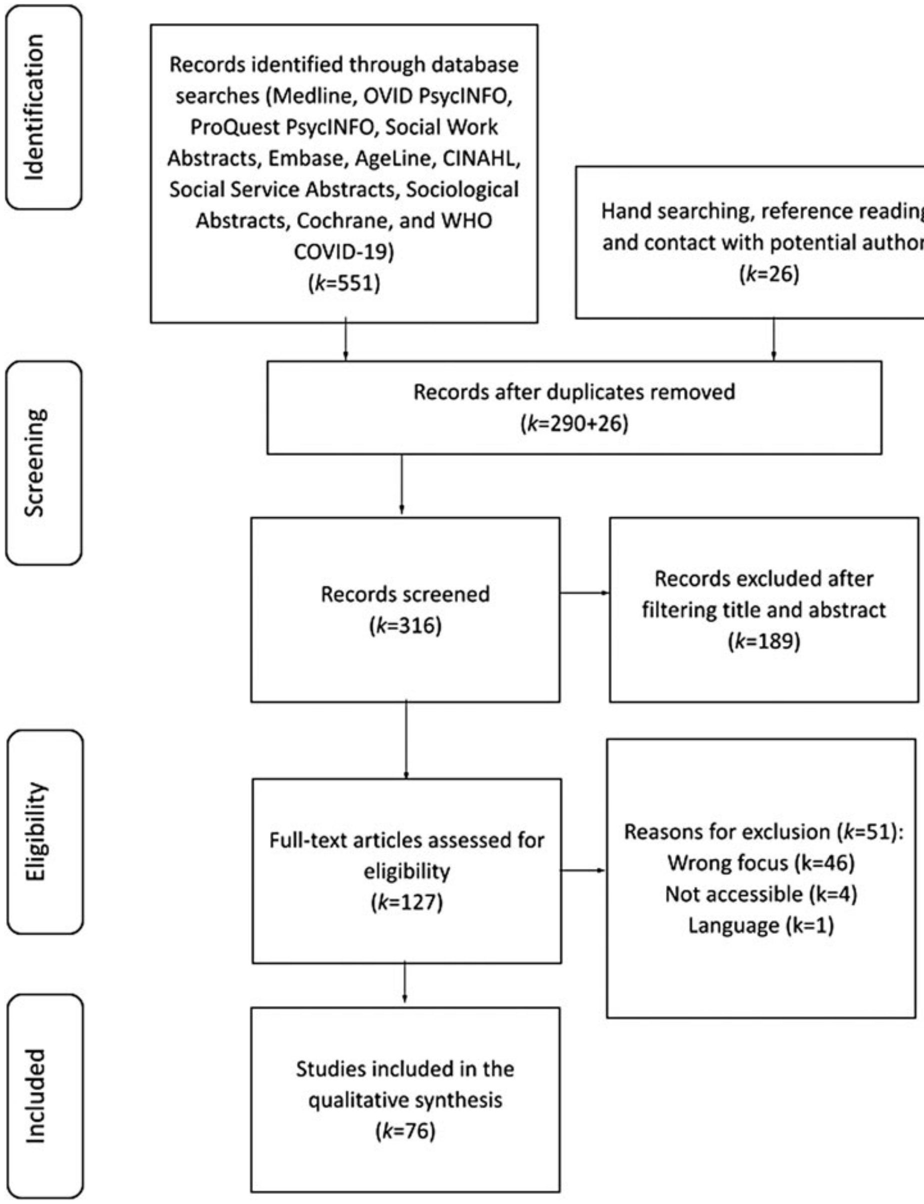
Identification
Records identified through database searches (Medline, OVID PsycINFO, ProQuest PsycINFO, Social Work Abstracts, Embase, AgeLine, CINAHL, Social Service Abstracts, Sociological Abstracts, Cochrane, and WHO COVID-19) (k=551)
Hand searching, reference reading, and contact with potential authors (k=26)
Screening
Records after duplicates removed (k=290+26)
Records screened (k=316)
Records excluded after filtering title and abstract (k=189)
Eligibility
Full-text articles assessed for eligibility (k=127)
Reasons for exclusion (k=51): Wrong focus (k=46) Not accessible (k=4) Language (k=1)
Included
Studies included in the qualitative synthesis (k=76)

FIG. 1. Identification of studies, inclusion, and exclusion assessment.

3. Profile of mode of consumption;
4. Context of using cannabis;
5. Factors contributing to use;
6. Factors inhibiting use;
7. Adverse clinical and psychiatric outcomes of cannabis use during the pandemic;
8. Similarities between EVALI (E-Cigarette or Vaping Product Use-Associated Lung Injury) and COVID-19 symptoms;
9. Implications for policy and practice.

The articles included are mapped according to themes and subthemes in Table 2. The coding legend is given in Table 3. The 76 studies identified in this scoping review included 11 surveys, 2 case studies, 9 commentaries, 8 reports, 6 case reports, 2 opinion pieces, 4 secondary analyses, 4 letters to the editor, a qualitative and a quantitative study, a longitudinal study, a cross-sectional study, a consultation article, a population-based study, an analytical study, a newsletter, a comparative correlational study, an editorial, a literature review, an ecological geospatial study, an opinion piece, and a systematic review.

Table 2. Data from articles including in the review ($n=76$)

Author(s)	Type of reference	Themes
Barratt and Aldridge[70]	Commentary	F
Bartel et al.[32]	Longitudinal study ($n=70$), Canada	A2, B, E1, G
Berman et al.[85]	Report	I
Bochicchio et al.[38]	Qualitative study ($n=16$), United States	B, E1, E2
Boehnke et al.[27]	Cross-sectional study ($n=353$), United States	A2, B, E1, F, I
Bonnici et al.[31]	Cross-sectional study ($n=777$), Malta	A2, B, E1
Borgonhi et al.[74]	Commentary	G
Busse et al.[28]	Descriptive study, survey ($n=5021$), Germany	A2, B, E1
Capuzzi et al.[86]	Cross-sectional study ($n=225$), Italy	C, E1
Carlyle et al.[33]	Consultation article, Australia	A2, C, E1, I
Chavan et al.[39]	Population-based study ($n=275$ for reverse migrants; $n=276$ for undisplaced), India	A1, D
Chiappini et al.[87]	Opinion piece	I
Cousijn et al.[63]	Research report; $n=120$; reference group of non using controls, $n=63$	B, E2
Darmawan et al.[58]	Case report	C, D, H
Devaraj and Patel[62]	Secondary analysis of a two-wave longitudinal national survey—The UAS, United States ($N=5132$)	E1, H
DeWitt[88]	Policy analysis, case study of three states, United States	I
Diaz et al.[80]	Case report	B, H
Djordjević and Dobovšek[71]	A survey of crimes stat and media in six countries	F
Dozois[29]	National survey ($n=1803$), Canada	A2, B, I
Dumas et al.[21]	Descriptive study, survey ($n=1054$), Canada	A1, A2, B, C, E1
El-Gabalawy and Sommer[44]	Secondary analysis	A2, B, E1, I
Esprit et al.[57]	Case report	D, E1
European Monitoring Centre for Drugs and Drug Addiction[89]	Report	I
European Monitoring Centre for Drugs and Drug Addiction and Europol[90]	Report	E1, I
European Monitoring Centre for Drugs and Drug Addiction[16]	Report	A2, E1, F
Farhoudian et al.[34]	Descriptive study, cross-sectional survey ($n=185$ from 77 countries)	A2, C, F
Gaiha et al.[40]	Cross-sectional study ($n=2167$), United States	A2, B, D, E1, I
Galo et al.[60]	Case report	D, H
Gharib[81]	Case report	H
Gili et al.[24]	Descriptive study, survey ($n=30$), Italy	A2, F, G
Gómez-Galán et al.[22]	Cross-sectional study ($n=310$), Spain	A1, B, C
Grebely et al.[35]	Commentary	A2, I
Groshkova et al.[91]	Commentary	F
Hatoum et al.[77]	Secondary analysis of GWAS summary statistics	G
Hawk et al.[59]	Case report	D, H
Imtiaz et al.[17]	Cross-sectional study ($n=3012$), Canada	A1, A2, B, E3, F
Khalsa et al.[67]	Commentary	E2, I
Knell et al.[23]	Analytical study ($n=1809$), United States	A1, A2, B, E1
Land et al.[78]	Letter to the editor	H
Lapeyre-Mestre et al.[83]	Newsletter	I
Lázaro-Pérez et al.[45]	Cross-sectional study ($n=310$), Spain	B, G
Liébana-Presa et al.[46]	Comparative correlational study ($n=300$), Spain	B, C, E1
Lukács[47]	Cross-sectional study ($n=421$), Hungary	A2, B, E1, I
Maggs[61]	Editorial	A2, C, E1, G
Manthey et al.[36]	Cross-sectional study ($n=36{,}538$), European Countries?	A2
Matthay and Schmidt[92]	Commentary	E2, I
Melamed et al.[79]	Commentary	G, I
Mota[64]	Letter to the editor	E1, G, I
NANOS Research[43]	Report	A2, B, C, E1, F
Nelson et al.[84]	Secondary analysis of community-based treatment service data ($n=321$), Nigeria	E2, I
Opp and Mosier[82]	Policy analysis, case study of three states, United States	I
O'Sullivan et al.[69]	Literature review	E3, G
Palamar et al.[48]	Quantitative approach ($n=128$), United States	A2, B, E2

(*continued*)

Table 2. Continued

Author(s)	Type of reference	Themes
Palamar and Acosta[65]	Descriptive study, survey ($n=128$), United States	C, E2
Pascual Pastor et al.[66]	Commentary	E3, G
Price[37]	Cross-sectional study ($n=2005$), Canada (Ontario)	A2, B, G
Reece and Hulse[93]	Ecological Geospatial Study	C
Richter[73]	Commentary	B, F
Robillard et al.[25]	Cross-sectional study	A2, E1
Rolland et al.[53]	Descriptive study, survey ($N=666$), France	B
Rotermann[20]	Report	A2, E1
Sharma et al.[49]	Cross-sectional study ($n=542$), United States	A2, B, C
Shekhar and Hannah-Shmouni[56]	Letter to the editor	C, D, G
Starks et al.[51]	Cohort-control study ($n=455$), United States	A2, B, C
Tucker et al.[41]	Descriptive study survey ($n=90$), United States	A2
UNODC[94]	Report	I
van Laar et al.[18]	Cross-sectional study ($n=1563$), Netherlands	A2, B, D, E1, G
Vanderbruggen et al.[26]	Cross-sectional study ($n=3632$), Belgium	A2, B, C, E1
Vidot et al.[30]	Cross-sectional study ($n=1202$), United States	A2, B, D, E1
Volkow[76]	Opinion piece	G
Weber et al.[52]	Cross-sectional study ($n=1145$), Brazil	A2
Wei and Shah[75]	Systematic review	G
Welle-Strand et al.[54]	Cross-sectional study ($n=226$), Norway	E1
Wise[72]	Letter to the editor	F
Yoon et al.[68]	Cross Sectional Survey of Tweets ($n=6144$)	E3
Zajacova et al.[55]	Cross-sectional study ($n=4319$), Canada	A2, B, C, E1

GWAS, genome-wide association study; UAS, Understanding America Study; UNODC, United Nations Office on Drugs and Crime.

Sample sizes for the surveys ranged from 16 to 36,538. Studies were conducted in 15 countries including: United States. ($n=13$), Canada ($n=6$), Spain ($n=3$), Italy ($n=2$), Australia ($n=1$), Malta ($n=1$), Germany ($n=1$), India ($n=1$), Hungary ($n=1$), Nigeria ($n=1$), France ($n=1$), Netherlands ($n=1$), Belgium ($n=1$), Brazil ($n=1$), and Norway ($n=1$).

Prevalence and trends of cannabis use during COVID-19

Of all the studies reviewed, three general observations were noted: (a) no studies examined initiation or cessation; (b) some studies examined escalation, and in those articles some reported stable use, whereas others reported increases—particularly among heavy users; (c) there were increases in some countries, although this may be due to the methodological factors versus actual patterns of use. Overall, the prevalence of cannabis use ranged from 12% to 23% across studies conducted during the COVID-19 pandemic looking at respondents' use of cannabis in the past 7-day,[17] the past 3-week use,[21] the past 3-month use,[22] and the past 30-day use.[23]

Table 3. Coding legend of main themes and subthemes identified in the review

Prevalence and trends	
Prevalence	A1
Trends	A2
Demographics	B
Context of using cannabis	C
Profile of mode of consumption	D
Factors contributing to use	
Psychosocial stressors	E1
Accessibility to cannabis	E2
Advertising and promotional use	E3
Factors inhibiting use	F
Clinical and psychiatric outcomes	G
EVALI	H
Implication for policy and practice	I

EVALI, E-Cigarette or Vaping Product Use-Associated Lung Injury.

Thirty-three studies reported changes when comparing the prevalence of cannabis use before and during the pandemic. Of the 33 studies, 15% examined specifically the change in use pertaining to the effects of lockdown measures looking at the change pre- and postlockdown.[18,23–26]

It is important to note that all the 33 studies were significantly heterogeneous with respect to their study design, study population, and data sources. Moreover, there lacks a standardization of timeframe of use across all these studies. Due to a significant degree of heterogeneity across these studies, the reported trends of cannabis use varied greatly. The majority of the studies simultaneously examined statistics in trends of reduction, increase, and no change in cannabis use among users. Twenty-seven percent of the studies were in agreement that the use of cannabis remains stable among users.[18–20,23,26–30]

Among the studies that reported a change in users' cannabis use, they noticed that there were more users reporting an increase in use than users reporting a reduction in use.[18,27,28,30–37] Additionally, of cannabis users reporting an increase in their consumption, their history of prior use and frequency of use before the pandemic greatly influenced the observed trajectories.[16,26,31] In particular, individuals who had a history of frequent/heavy use reported a steeper increase in use during the pandemic in comparison to users with a history of light or occasional use.[16,28]

Several studies also noted that increased cannabis use was prevalent among vulnerable populations, including underaged youth, homeless youth, migrant workers, and LGBTQ+ women.[38–41] Moreover, variations of both prevalence and trends were observed across and within countries, with countries such as France, Italy, the Netherlands and Portugal reporting increasing trends,[34] although the reasons for such variations remain unknown.[16]

However, caution is warranted when interpreting the findings as majority of the studies did not use representative samples, thereby limiting generalizability of findings. Given the retrospective nature of these studies, the interpretation of their findings from self-reported data is subject to a significant degree of recall bias.[42]

Demographics

Most studies provided information on the sociodemographic characteristics of cannabis users, including age, gender, race/ethnicity, and level of education. There was considerable variation on the typical age of cannabis users in the included studies, with 14 articles noting that the majority are between 18 and 35 years.[18,20,22,32,38,40–49] Other research has shown that it is nonetheless not uncommon to see adult cannabis users between the ages of 36 and 65 years.[14,23,27,34,35,47–50]

Several articles indicated that the majority of cannabis users included in their studies were female.[23,37,46,48,50] It is impossible to determine whether women use cannabis more than men, or *vice versa*, because of the lack of representative sampling in these studies. Several articles provide the ethnic backgrounds of cannabis users. Whites were the most predominant consumers.[17,23,30,40,51,52]

Many studies also discussed users of color including Blacks, Latinos, Hispanics, Asians, and others.[17,23,30,38,40,41,48,51,52] Rolland et al.[53] and Palamar et al.[48] found that those with lower levels of education had increased cannabis use during the pandemic. However, nine other articles noted that users were more likely to have completed a bachelor's degree or have attended a college compared to only having a high school diploma.[17,23,26,30,37,48,49,52–55] There is a clear need for population-based studies to better understand the demographics of cannabis users during the pandemic.

In sum, surprisingly few subgroup analyses were conducted, with the exception of education attainment of cannabis users. The results on education attainment were somewhat mixed. Disappointingly, the majority of studies failed to investigate important facts such as whether respondents had children and/or live-in partners, which would likely influence consumption during the pandemic.

Profile of mode of consumption

Cannabis has many modes of consumption, including smoking (blunt or joint), hookah, alternative cannabis products such as edibles (e.g., bhang) and pills (e.g., ganja), and vaping. One study mentioned the consumption of cannabis via smoking a joint or a pipe.[30] Another study mentioned the use of cannabis via a hookah.[56] Four articles discussed alternative cannabis products, including ganja pills,[57] and edibles.[18,39,40] Three studies reported users vaping cannabis via vaporizing devices.[58–60]

Most other studies did not recognize or specify mode of consumption and no representative study provided a break-down of the prevalence of each mode of consumption. There is a lack of longitudinal data that permits comparison of prepandemic information on demographics and mode of consumption with information gathered during the pandemic.

Context of using cannabis

Six studies reported on the context of cannabis use during the pandemic. For example, these studies reported on whether cannabis use with others was primarily in-person,[34,58] and/or virtually with peers[21,48,61] and partners.[51] Concerns were raised with regards to the increased risk of contracting the COVID-19 virus as a result of violating social distancing rules[21] and sharing cannabis products (joint, blunt, and other forms of edibles) and tools (vaporizing device, paraphernalia, and hookah) when consuming cannabis in in-person group settings.[56]

In contrast, Vidot et al.[30] noted that, since the beginning of the pandemic, 37% of cannabis joint users stopped sharing and 59% of cannabis users did not share their devices with others. Nonetheless, caution is warranted when interpreting the findings as the majority of studies drew their findings from convenience samplings. The lack of representative samples greatly limits the generalizability of findings.

Factors contributing to use

A total of 37 sources (49%), discussed multiple factors that may contribute to the use of cannabis during the pandemic, including psychological stressors, changes in the accessibility of cannabis, promotion of the use of cannabis, and decreased access to treatment centres. It is important to note that the validity of these studies may be limited owing to the duration of time in which they took place during the pandemic. Psychological stressors such as anxiety and change in life patterns, appeared to be the strongest influences in using cannabis. Studies that include longitudinal research would be highly recommended and valuable in determining the extent of these influencing factors.

Isolation and psychosocial stressors. Several articles (29%) have reported changes in lifestyle, psychosocial stressors,[62] and mental health as common contributing factors toward the increased use of cannabis during the pandemic. Bartel et al.[32] found a 20% increase in cannabis use among those who followed stay-at-home measures, while van Laar et al.[18] identified a 53% increase in the frequency of cannabis use among individuals who were not daily users before the lockdown. Reported motives for cannabis use postlockdown included reported job loss,[38,57,63] loss of social interaction,[38] and loss of structured routine.[20,26,38]

As a result of these lifestyle changes, boredom was reported in 6% of the articles, as a significant contributing factor to increased cannabis use.[18,23,26,27,38] In a study of Dutch participants,[18] self-reported use had increased by 43%, with boredom (78%) being the most commonly stated reason. Vidot et al.[30] found that participants with mental health conditions who used cannabis medicinally prepandemic increased their use by 90%.

Numerous studies (5%),[16,27,44,64] reported anxiety as a contributor to cannabis use. Specifically, anxiety related to contracting COVID-19 was noted as a common factor among these studies.[25,31] Anxiety was measured through the Patient Health Questionnaire (PHQ-9)[39] and the General Anxiety Disorder (GAD) Measure.[37,44] Several studies (5%) identified an increase in depression, as a result of self-isolation, as a motive for the use of cannabis.[23,31,32,43] Finally, one study identified that adolescents' concerns around social status[61] was a motivation influencing their use of cannabis.

Accessibility to cannabis. Palamar et al.[48] found that among partygoers reporting the use of cocaine, ecstasy, and lysergic acid diethylamide (LSD), the frequency of use of all drugs including cannabis had decreased during the pandemic as a result of the closure of nightlife venues. In contrast, individuals who were cannabis users before the pandemic, reported a 35% increase in the frequency of use since the implementation of stay-at-home orders. It has been suggested that access to drugs such as cocaine, ecstasy, and LSD is limited due to restrictions around social gatherings, parties, and the closure of dance clubs.[48] Individuals who typically use "party drugs" may resort to using cannabis more due to its easier accessibility.[65]

In Canada and in certain states in the United States where cannabis is legal, sales increased during the pandemic.[18] In these regions, dispensaries were deemed to be essential businesses. In contrast, a study conducted in the United States, Boehnke et al.[27] found that individuals who did not have legal access, reported a decrease in use because cannabis products were less available.

Advertising and promotion of use. Some research reported advertising about the therapeutic properties and use of cannabis as a treatment against the COVID-19 virus was an additional incentive toward use.[66,67] A cross-sectional survey[68] of tweets in social media among a cannabis network identified the presence of disinformation suggesting that the use of cannabis as a treatment for COVID-19. Although there was considerable variation in studies about the effectiveness of advertising, one study[69] noted the potential application of cannabis as a treatment for COVID-19-related anxiety disorders, such as post-traumatic stress disorder.

Factors inhibiting use

Several of the studies reported that social distancing measures and stay-at-home regulations were the main factors inhibiting the use of cannabis during the pandemic. Other researchers highlighted the inaccessibility of usual consumption settings, such as parties and festivals, and the lack of social gathering opportunities as additional reasons behind the decreasing levels of cannabis consumption.[43,70] Three studies reported that some users were unable to purchase cannabis as a result of financial constraints such as unemployment, lack of welfare payments, and/or other economic problems brought about by the pandemic.[37,70,71]

Since the in-person purchase of cannabis requires social interaction, the fear of contracting COVID-19, particularly among those who are immunocompromised, has inhibited cannabis use for some consumers.[27,70] In a policy analysis of case studies from six Balkan countries, users were less likely to purchase cannabis when there was an increase in its price.[71] Wise[72] reported that some families in the United Kingdom were unable to purchase medicinal cannabis for their loved ones' care because of its high price and their precarious financial conditions. Some youth who lived with their parents during the pandemic reported that there was a lack of access to cannabis and fewer opportunities for use due to the shelter-in-place regulations.[61,73]

Although it is difficult to draw any definitive conclusions regarding factors inhibiting use of cannabis during the pandemic, due to differences in research methodology and target metrics, two sub themes emerged: the social and economic factors. While some of the studies (6.6%) cited decreased levels of social contact as reasons behind lower rates of consumption, other studies (2.5%) reported different findings: some users feared socialization when using and purchasing cannabis during the pandemic.[27,43,61,70,73]

Within studies that looked at the economic factors, there is a common agreement that financial hardships and the increased price of cannabis dissuaded individuals from both recreational and medicinal use during the pandemic.[24,34,70–72] Lastly, it should be noted that the majority of the studies reporting on financial motivations behind cannabis consumption were conducted in Europe.

Therefore, it is possible that the increased price of cannabis and other economic issues brought about by the pandemic may not influence users' level of consumption in other parts of the world. Longitudinal studies with larger and more diverse samples are needed to gain a better understanding of the factors that inhibit cannabis use during the pandemic.

Adverse clinical and psychiatric outcomes of cannabis use during the pandemic

A total of 14 studies (18%) reported data on the adverse clinical and psychiatric outcomes of cannabis use due to the emergency measures implemented in response to the COVID-19 pandemic.

Increased susceptibility to respiratory diseases and COVID-19. A major health concern that emerged from the review is the increased susceptibility of cannabis users to COVID-19. Studies have documented the link between cannabis smoking and the onset of respiratory diseases, such as chronic obstructive pulmonary disease and compromised immunity, which may lead to an increased risk of contracting COVID-19.[66,74,75]

Furthermore, the mode of cannabis consumption may increase users' risk of contracting COVID-19 and also put them at risk for the related adverse health outcomes, such as brain complications and death.[76] For instance, those who shared paraphernalia (joints, pipes, bongs, or vaporizers) when using cannabis reported higher COVID-19 infections due to the exchange of respiratory droplets carrying the virus.[18]

Moreover, the frequent purchasing of cannabis, which often requires social interaction, and, in some cases, the violation of social distancing rules, puts heavy cannabis users at risk of contracting COVID-19.[18] Other health-related outcomes of cannabis use, especially heavy use owing to cannabis use disorder, was associated with an increased severity of COVID-19 symptoms and a greater risk of hospitalization.[77] Furthermore, the difficulty of differentiating between the symptoms of COVID-19 and the physical indicators of heavy cannabis use (such as coughing) may make it difficult for users to access appropriate health care services.[66]

The majority of available COVID-19 treatments may interact with cannabis.[78] As a result, cannabis users receiving treatment for COVID-19 may suffer from adverse side effects, such as nausea, diarrhea, and liver injury. Lastly, due to a lack of cannabis availability during the pandemic, some heavy cannabis users were more prone to experience withdrawal symptoms, such as mood swings, dysphoria, and sleep disturbances.[79]

Among the articles that investigated outcomes of cannabis use during the pandemic, a major conclusion was that cannabis use led to the greater likelihood of COVID-19 transmission due to weakened immunity secondary to respiratory diseases.[66,74,75] Another study reported increased likelihood of contracting COVID-19 upon cannabis use due to shared paraphernalia.[18]

Around 3% of the articles highlighted adverse health outcomes for excessive cannabis users in particular, such as increased severity of COVID-19 symptoms and hospitalization.[76,77] Similarly, 2.6% of the articles underlined the issues that heavy cannabis users experienced, such as withdrawal symptoms upon lack of access to cannabis because of shortage.[66,78] Another study reported that heavy users were less likely to distinguish between the symptoms of COVID-19 and cannabis overuse.[66]

Lastly, a few studies (2.6%) reported that most of the available COVID-19 treatments resulted in adverse side effects when used in conjunction with cannabis.[78,79] Although these findings provide a great insight into possible health-related outcomes of cannabis use during the pandemic, more studies conducted over a longer period with larger samples are needed.

Psychiatric consequences.

As mentioned earlier, heavy cannabis users were more likely to increase their consumption during the pandemic.[18,23–26] Some studies indicated that cannabis use was an effective way to deal with mental health challenges as a coping mechanism and was not associated with psychological distress.[62] Other studies reported several negative psychiatric complications and behavioral reactions among cannabis users, including psychotic symptoms, anxiety, insomnia, anger, and aggression.[74] In a study with Spanish college students, participants who were cannabis users were also more likely to suffer from mental illness.[45]

Other studies reported positive outcomes of cannabis use, such as anticipated relief from COVID-19-related stress and anxiety.[69] In contrast, other studies reported that cannabis consumption during the pandemic was associated with a greater likelihood of engaging in high-risk online gambling,[37] self-neglect, a lack of motivation, and apathy.[64] Therefore, there is a lack of agreement among the studies reviewed as to whether cannabis consumption led to positive or negative psychiatric consequences during the pandemic.

Similarity between EVALI and COVID-19 symptoms

Notably, five studies involving a total of seven case reports detailed the physical and respiratory symptoms observed in patients diagnosed with EVALI. These patients tend to be younger adults, aged from 16 to 36. These studies highlighted similarities between reported EVALI symptoms and common symptoms of COVID-19, such as cough, fever, and difficulty breathing. Therefore, the researchers warned against the potential misdiagnosis of EVALI as COVID-19 in patients who use cannabis.[58–60,80,81]

Implications for policy and practice

Of the articles that met our inclusion criteria, 18 provided suggestions for the cannabis industry and policymakers on how to improve safe access to cannabis. The articles also proposed possible methods practitioners could use to strengthen virtual mental health support services for individuals using higher amounts of cannabis during the COVID-19 pandemic.

Considerations for policymakers.

Some discussions centered on whether to classify cannabis dispensaries as essential businesses during the pandemic for both public health and economic reasons. Guided by the philosophy of harm-reduction, several articles called upon policymakers to ensure a stable and safe supply of both medical and recreational cannabis to prevent individuals from consuming other addictive drugs as substitutes for cannabis.[27,35]

Opp and Mosier,[82] highlighted the tax revenue that the cannabis industry generated prepandemic, arguing that classifying dispensaries as “essential” would allow for the generation of increased tax income that could benefit economies negatively impacted by the COVID-19 pandemic. To ensure trends of substance abuse and dependence are accurately observed, careful monitoring of cannabis and other substances during the pandemic was also deemed to be an essential measure.[83]

Implications for service delivery.

Emerging research suggests a need for improvements in virtual support to address various mental health challenges faced by individuals, such as depression, loneliness, and anxiety induced by the pandemic, for these mental health stressors were predictors for the increasing prevalence of cannabis in populations.[44,64] Telehealth, virtual and phone counseling, and active outreach treatment programs are particularly important during the pandemic because such programs are able to ensure the continued provision of emotional and psychological support to prevent individuals from engaging in maladaptive coping behaviors.[29,33,44,84]

More educational resources on available mental health support services and on the possible consequences of addictive use of cannabis and other drugs were also deemed important in response to the prevalent use of cannabis.[22,25,47,51,64]

Conclusion

Research on cannabis use during the COVID-19 pandemic continues to be a fast-moving field. There is considerable variation on the reported prevalence and trends in cannabis use across and within countries. Psychosocial stressors, including isolation, anxiety, and depression were found to be major predictors of increased use. These findings call for ongoing education and training regarding moderation of cannabis use and prevention of cannabis misuse.

In addition, there are concerns pertaining to increased risk of transmission in the context of using cannabis in social settings during the pandemic, there is a need for harm reduction-informed policy measures to address adverse clinical and psychiatric outcomes, safe access for cannabis, and continued monitoring of cannabis use during and after the pandemic.

There are several important limitations to this scoping review that must be considered as they may be an important source of bias: (a) limited studies used representative, population-based samples leading to a disproportionate representation of younger demographics among users; (b) all studies were based on self report rather than objective measures of cannabis consumption. Self-report measures are subject to recall bias and tend to be underestimated;[42] (c) unfortunately there was lack of research using longitudinal studies that commenced prepandemic; so our findings on the profile of users, prevalence of use, and mode of consumption lacked a valid prepandemic comparison group.

Therefore, trends and/or changes are more difficult to interpret; (d) although some of the measures of mental health outcomes in the included studies used standardized valid and reliable scales (e.g., GAD-7, PHQ-9), other studies relied on simple self reports that were not verified for validity; (e) furthermore, studies were restricted to those published in English. Future research would benefit from population-based studies and further examination of factors contributing to the increased use of cannabis during the pandemic and to the associated negative consequences.

Future research should also consider including literature from non-English sources because the increasing use of cannabis remains a worldwide phenomenon.

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Abbreviations Used

EVALI = E-Cigarette or Vaping Product Use-Associated Lung Injury
GAD = General Anxiety Disorder
GWAS = genome-wide association study
LSD = lysergic acid diethylamide
PHQ-9 = Patient Health Questionnaire-9
SARS-CoV-2 = severe acute respiratory syndrome infection
UAS = Understanding America Study
UNODC = United Nations Office on Drugs and Crime